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BRITISH COLUMBIA SAFETY AUTHORITY
2006 STATE OF SAFETY REPORT

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WHO WE ARE

The British Columbia Safety Authority is an independent, self-funded corporation that provides cost-effective and essential safety services to business, industry and the general public throughout the province.

We are responsible for overseeing the safety of the following industry sectors in the province:

- amusement rides and recreational railways
- boilers, pressure vessels and refrigeration systems
- electrical equipment and systems
- elevating devices such as elevators and escalators
- gas appliances and systems, including hydrogen
- passenger ropeways such as ski lifts, and
- railways.

Our prime assets are our creative, knowledgeable, highly qualified, skilled and experienced employees, who have a collective passion for safety. We have an abundance of resources and expertise to draw from in our workforce, including experienced tradespeople who provide services to our clients.

Our services include:

- preventing accidents
- educating the public about safety issues
- issuing permits
- inspecting technical work and equipment
- certifying individuals and licensing contractors to meet regulatory requirements
- reviewing regulations for each industry sector we oversee
- investigating incidents
- registering new equipment designs, and
- contributing to provincial and national code development.

COVER PHOTO: TO ENSURE SAFETY FOR INDIVIDUALS WORKING WITH ELECTRICITY OUTDOOR, AIR QUALITY IN CONFINED SPACES IS REGULARLY MONITORED.

2008-02662/

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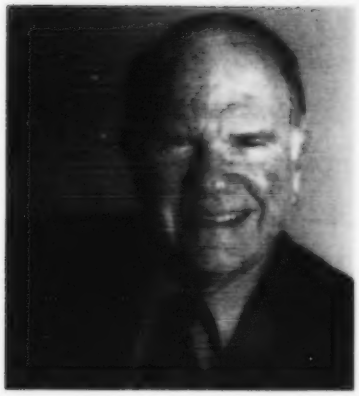


MESSAGE FROM THE CHAIR

This is the third *State of Safety Report* published by the BC Safety Authority. The report is an important way for us to share information with the public about safety incidents in each of the technology areas overseen by the Authority.

As in prior years, although the data presented in this report is accurate, it does not reflect all incidents that occurred province-wide. A number of municipalities within the province provide electrical and gas safety services to their own residents, and as a result, their data is not included in this report. While the BC Safety Authority has implemented important initiatives to improve the state of incident reporting and to strengthen data collection channels, it is crucial that the incidents reported to these municipalities are included in the future versions of this report. By doing so, we will obtain a clear view of the state of safety for all of British Columbia.

Strong industry partnerships and positive client relationships are critical to obtaining accurate data, and I would like to commend the BC Safety Authority for its ongoing efforts to maintain and strengthen these relationships.

As a Board, we are confident in the new direction of the BC Safety Authority. The BC Safety Authority is in the process of defining a new operational vision based on predictive modelling and identifying and preventing primary and secondary causes of safety failures.

On behalf of the Board, I want to thank the employees of the BC Safety Authority for the invaluable work they do—whether it's conducting inspections, consulting with our clients or partnering with industry associations to improve safety. It is this commitment that is creating a safer province for all of us.

Sincerely,

JOHN F. WATSON, P. ENG
CHAIR OF THE BOARD

MESSAGE FROM THE PRESIDENT & CHIEF EXECUTIVE OFFICER

Each year, the BC Safety Authority reports on the state of safety in the province, summarizing the number and type of incidents that occurred over the previous year in each of the technology areas we oversee.

One of the key challenges we face as an organization is collecting accurate and comprehensive data about safety incidents. Our Safety Officers conduct thousands of inspections each year, and their reports provide us with an important understanding of safety levels and trends. We know, however, that inspections offer us just one small window into the larger picture. That's why our partnerships with our clients and industry associations are so important, as they can provide us with more complete data.

Our clients are the first line of accident prevention—they are operating ski lifts, maintaining escalators, operating boilers and installing electrical systems. And when they experience incidents, we want to know about it. That's why we are focusing on strengthening our industry partnerships and reporting systems so that we can increase the level of incident reporting and get a more complete understanding of safety risks. Armed with this knowledge, we can then put in place the systems and procedures to prevent incidents from happening in the first place.

This is already happening in some industries. The passenger ropeway technology area, for example, represents a successful model of a strong partnership between an industry group and the BC Safety Authority. As an industry, this group provides us with a significant amount of detail about incidents—not only whether an incident has occurred, but specific information about when it occurred, whether the passenger was loading or unloading, whether it was a complete or partial fall and even whether it was just a potential incident. With this information in hand, we can then do a root-cause analysis, identify solutions and communicate this knowledge to prevent similar incidents from occurring in the future.

To put it plainly, we want all the relevant data that is available. And we want our industry partners to know that the more of this information they share with us, the better. Part of this commitment is assuring our industry partners that we will not penalize them when they report an incident within 24 hours. All industries have incidents. By sharing information about these incidents, we can work together to prevent accidents and improve the level of safety across this province.

I would like to take this opportunity to express my appreciation to all of our employees, clients and industry partners for the work they do to improve the level of safety in our province.

Sincerely,

HARRY DIEMER
PRESIDENT & CHIEF EXECUTIVE OFFICER

GAS SAFETY OFFICER, DOUG SPELLER, BASED IN VICTORIA, BC, COMPLETES INSPECTIONS THROUGHOUT THE YEAR. REPORTS PREPARED BY SAFETY OFFICERS PROVIDE THE BC SAFETY AUTHORITY WITH IMPORTANT INFORMATION ABOUT SAFETY LEVELS AND TRENDS.

USING INCIDENT DATA TO PREDICT & REPORT ON SAFETY

Many safety organizations use the reporting of "incidents" and the annual totals of these numbers to establish a trend and describe the overall level of safety.

While this is one method that can be used, it may be misleading for a number of reasons:

- → Only a fraction of the incidents that have occurred may be reported, especially if there are perceived adverse consequences for reporting;
- → Reporting levels are not constant over time and not uniform across all segments of the industry. This can lead to inaccurate conclusions;
- → Small sample sizes may not yield statistically significant results; and
- → Safety is more than just a collection of incident statistics.

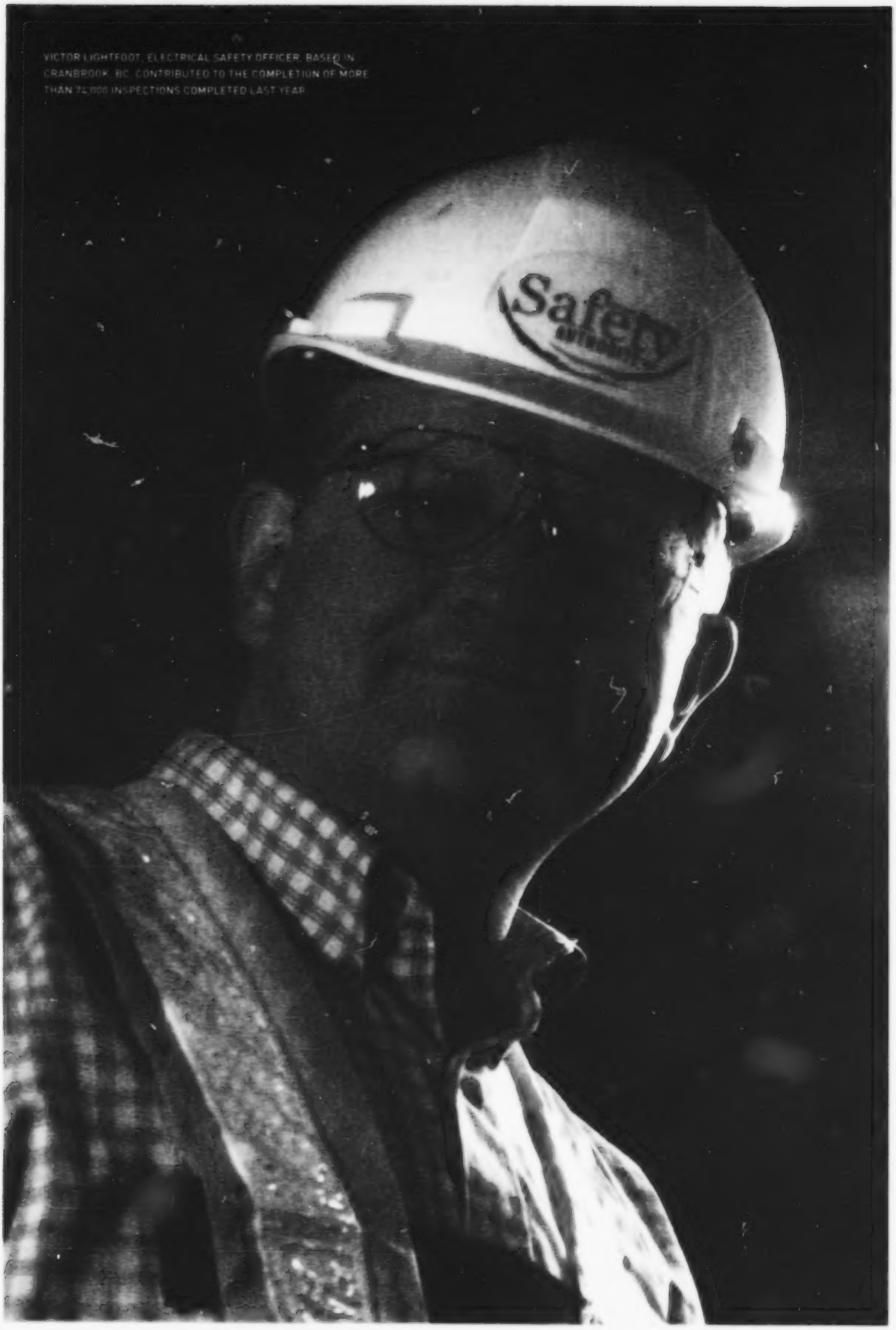
We are in the early stages of data collection for technical safety in BC, after recently initiating a best practices incident reporting system in January 2007. Part of these best practices is the expectation that we increase public awareness and in turn increase levels of reporting over the next three to five years.

The result will be an increase in incidents reported each year and an improvement in the overall safety consciousness exercised by everyone participating in the safety system.

In the meantime, we will use the data we receive to target our risk control activities at the highest risk areas in each technology we regulate. We will:

- → Analyze the incident data we do receive;
- → Develop information that may be applied to an entire sector;
- → Carefully analyze the data, so as not to draw false trends or conclusions; and
- → Corroborate our incident data analysis with industry consultation, professional judgement of the Provincial Safety Managers and comparisons to trends established in other jurisdictions.

Ultimately, our goal is to increase the level of safety in BC. By analyzing the data that is available to us and further developing safety measures designed to uphold public safety, we will prevent accidents from happening.



VICTOR LIGHTFOOT, ELECTRICAL SAFETY OFFICER, BASED IN CRANBROOK, BC, CONTRIBUTED TO THE COMPLETION OF MORE THAN 74,000 INSPECTIONS COMPLETED LAST YEAR

ABOUT THIS REPORT

This *2006 State of Safety Report* provides an overview of all reported incidents between January 1, 2006 and December 31, 2006—the second full year of operations for the BC Safety Authority.

The report reviews incident data from the industry sectors that the BC Safety Authority oversees: electrical installations; gas installations; elevating devices; boilers, pressure vessels and refrigeration equipment; passenger ropeways; amusement devices; recreational railways; and specific railways.

The *State of Safety Report* describes the number, types and causes of incidents within each industry, and also identifies the risks found through inspections done by our Safety Officers or through investigating incidents. This report summarizes incident and inspection data within our jurisdiction, and as a result, incidents occurring in municipalities that offer their own electrical and gas safety services, such as Vancouver and Burnaby, are not included in this report.

In addition, the *State of Safety Report* provides inspection data from over 74,000 inspections performed by our Safety Officers in 2006. This data is presented in terms of non-compliance, which is an instance where our Safety Officers have found that the work performed does not comply with minimum code or safety regulations.

The information provided in this report is published and shared so that we can work with other organizations to improve public safety and to identify challenges that may arise within each industry.

In the coming years, we will begin to see significant changes in how we report incidents. On January 1, 2007 we launched our new incident reporting system that enables us to develop strong baseline statistics for measuring the future performance of the safety system. Moreover, we will be working with municipalities that provide their own safety services to streamline reporting functions so that future editions of this report can be applied on a province-wide basis.

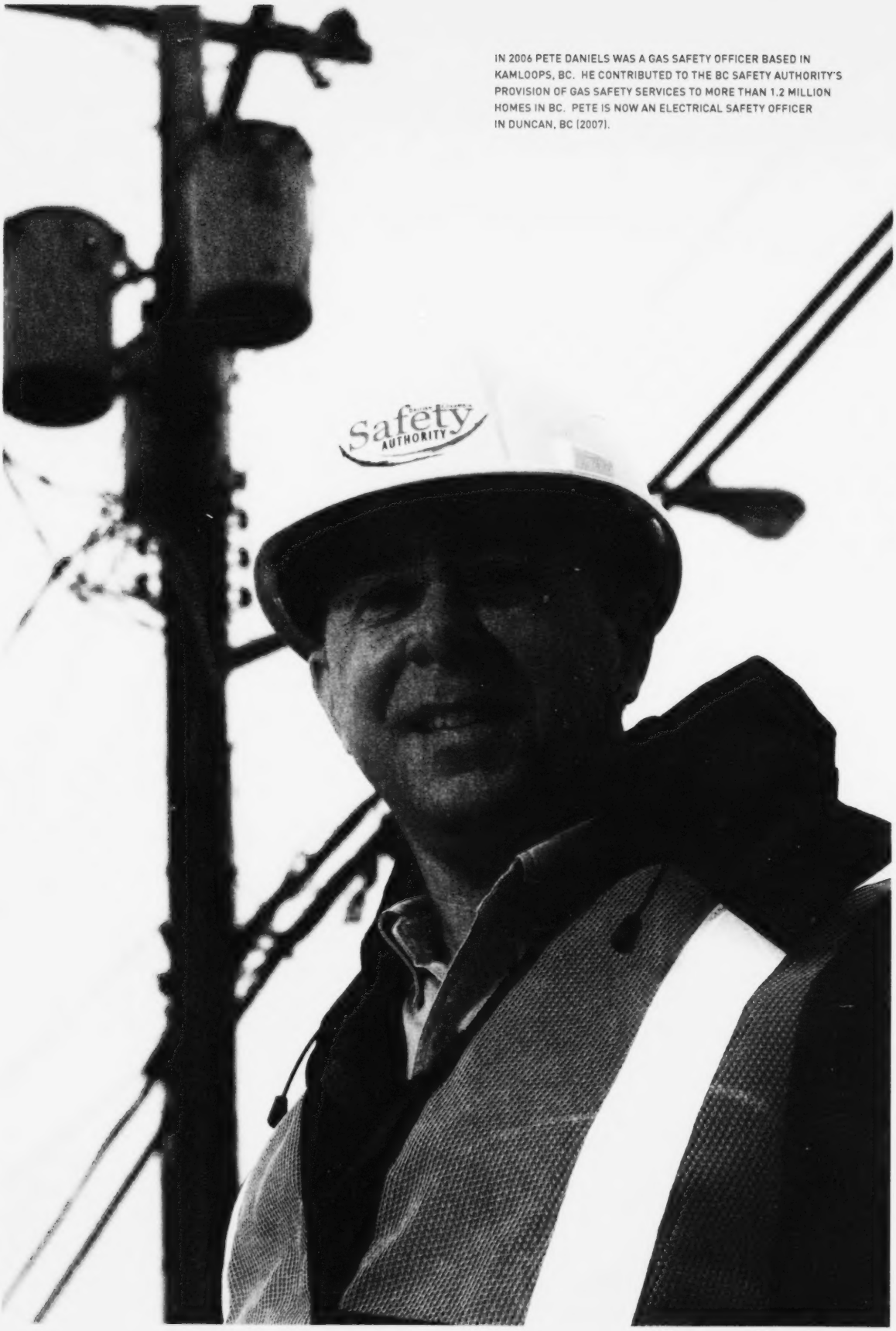
For reference and clarification purposes, a list of commonly used terms and definitions is included on page 28 of this report.

INTERPRETING DATA FOR COMPARATIVE PURPOSES

Since the BC Safety Authority began operations on April 1, 2004, we have continued to refine our incident reporting system and data collection methods. Changes in our data collection methods have improved the accuracy of our results for 2006; however, as a consequence, these results cannot be used to identify trends, assess outcomes or conduct comparisons with previous years as the data collection methods are notably different. In spite of these limitations, the data from previous years is still valuable since it is used to develop new parameters for future research and case studies for educational purposes.

As a result of increased reporting by industry, we have been notified of 557 incidents over 2006, which is our single highest number of incidents reported in one year. We are well aware that this figure only represents a fraction of the actual number of incidents that occur annually. Incidents occurring outside of the BC Safety Authority's jurisdiction are not included in this report. This includes nearly 715,000 residential homes in the electrical technology area and another 560,000 homes in the gas technology area that all have their safety services provided and reported by their respective municipalities. As we begin to reconcile the reporting functions for these jurisdictions we will start to see a noticeable increase in the number of reported incidents.

We realize that not all incidents are reported to the BC Safety Authority. With this in mind, it is important to note that the information presented in this report does not represent the absolute level of safety for a particular industry sector or technology; rather, it highlights safety risks and identifies areas where we can improve safety in British Columbia.



IN 2006 PETE DANIELS WAS A GAS SAFETY OFFICER BASED IN KAMLOOPS, BC. HE CONTRIBUTED TO THE BC SAFETY AUTHORITY'S PROVISION OF GAS SAFETY SERVICES TO MORE THAN 1.2 MILLION HOMES IN BC. PETE IS NOW AN ELECTRICAL SAFETY OFFICER IN DUNCAN, BC (2007).

REPORTED INCIDENTS IN 2006

There were 594 suspected incident cases reported to the BC Safety Authority in 2006. This figure does not include the approximately 1,800 cases involving line-hits that occur annually to underground infrastructure, since these cases are reported separately from our incident data. Further investigation concluded that 37 of these cases were not related to the technology in question, and these cases were therefore removed from further statistical consideration. This leaves the total number of reported incidents for 2006 at 557.

INDUSTRY SECTOR / TECHNOLOGY	INCIDENT REPORTS RECEIVED	DISQUALIFIED AS AN INCIDENT	ACTUAL INCIDENTS
Electrical	158	29	129
Gas	59	6	53
Elevating Devices	60	1	59
Boilers, Pressure Vessels & Refrigeration Equipment	6	0	6
Passenger Ropeways	135	1	134
Amusement Rides	13	0	13
Recreational Railways	3	0	3
Railways	160	0	160
Total	**594**	**37**	**557**

The number of incident reports received within a technology area is directly related to the maturity of that sector's safety management system—more incident reports indicate that the industry has a greater focus on safety and stakeholders are dedicated to capturing as much information as possible. As such, the growth in incident numbers is not a reflection of any increase in risk involved with public safety.

As expected, the number of reported incidents has increased compared to the previous year's total of 431. This comes as a direct result of increased stakeholder awareness about the need to report incidents and efforts by staff to build strong working relationships with contractors, owners and operators of the technologies we oversee. While our contractors are becoming more willing to report incidents, we must improve reporting consistency between our technologies. Certain areas, such as Passenger Ropeways and Commuter Railways, already benefit from a well-established reporting system with their stakeholders, although this is not yet the case for all industry sectors.

In the coming years, we expect the number of reported incidents to continue to rise as more people within BC become aware of the BC Safety Authority and our role within the safety system.

MORE THAN 25 PER CENT OF ELECTRICAL INSPECTIONS COMPLETED BY DAVE SHAVALIER AND OTHER ELECTRICAL SAFETY OFFICERS IDENTIFIED AT LEAST ONE NON-COMPLIANCE ISSUE. DAVE IS BASED IN CHILLIWACK, BC

MORE THAN 25 PER CENT OF ELECTRICAL INSPECTIONS COMPLETED BY DAVE CHAVALIER AND OTHER ELECTRICAL SAFETY OFFICERS CLASSIFIED AT LEAST ONE NON-COMPLIANCE ISSUE. DAVE IS BASED IN SMITHERS, BC.

IMPROVING SAFETY STANDARDS IN BRITISH COLUMBIA

As an organization, our mission is to protect the people of British Columbia by ensuring that technical systems, products, equipment and work are safe. We achieve this mission by providing four essential safety services: Education & Outreach, Research, Inspections and Enforcement.

EDUCATION & OUTREACH

It's a fact that human error is the cause of many incidents. To minimize the risks of personal injury and property damage, we are trying to raise public and industry awareness of both technical hazards and the requirements of the safety system. We are achieving this through our ongoing consultation and communication with industry-based technology committees, the public and stakeholders. This includes distributing educational material, hosting information sessions with industry and partnering with other organizations on public safety initiatives.

We also use a number of communication tools to ensure industry-wide actions. These include:

- → Directives—issued by Provincial Safety Managers to clarify interpretations of code or regulation requirements; provide direction concerning how a regulation will be applied; or serve as the instrument by which a Provincial Safety Manager exercises a power granted under the *Safety Standards Act*; and
- → Information Bulletins—non-statutory and non-binding instruments that provide general information to employees, stakeholders and the public;
- → Safety Orders—binding instruments issued by Provincial Safety Managers to prevent, avoid or reduce the risk of personal injury or damage to property.

In 2006, we published and distributed seven Information Bulletins, four Directives and two Safety Orders on topics such as securing water heaters[1], responsibilities with respect to certification[2] and supervision requirements under installation permits[3].

RESEARCH

To enhance the provincial safety system beyond its current levels, we must embrace a culture that makes sound decisions based on comprehensive research and analysis. To this end, we used a series of contractor meetings, surveys and outreach opportunities to engage thousands of different stakeholders throughout the province to conduct research into key areas that affect safety. Much of this research centred on our continued work with Project Horizon, which is our key public safety initiative focused on improving safety in British Columbia.

Within the past year, our research efforts have yielded a considerable amount of valuable knowledge that will benefit us in the coming years. This includes work that will influence how we identify, measure and prioritize risk, and more specifically, improvements that can be made to our existing processes and procedures. An example of an improved process is our incident reporting system, which was launched in January 2007 after extensive research and consultation. This system will enable us to monitor trends in each industry sector area we oversee.

As more opportunities arise, we look forward to developing strong academic research partnerships in BC and internationally as we seek solutions to public safety.

INSPECTIONS

During 2006, we performed over 74,000 inspections within the industry sectors we oversee. These inspections identified more than 21,000 non-compliance issues with the work that was performed, and required that further action be taken to ensure the safety of the equipment and the people who use it.

In addition to our own inspection services, we also oversee the work of approximately 15,000 Field Safety Representatives, who are individuals certified by the BC Safety Authority to independently inspect and declare that electrical work done by a contractor under a permit complies with regulations.

We assess certain risk factors for every permit that we issue, and we follow up with an inspection on those installations that present the greatest risk to public safety. Additionally, we also complete a number of random inspections throughout the year so that we can encourage our contractors to consistently and safely perform work and operate regulated equipment.

ENFORCEMENT

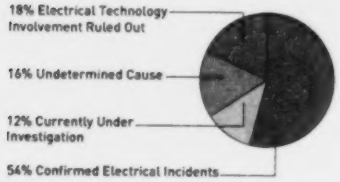
Enforcement plays a significant role in developing a dynamic and robust safety system. Guided by the *Safety Standards Act*, our enforcement activity includes a number of tools such as issuing a compliance order, levying monetary penalties, revoking contractor licences and suspending certificates of qualification. Our enforcement activity is designed to play an important role in bringing consistency to the safety system.

For further details regarding our enforcement activities and specific initiatives, please refer to our *Annual Report on Safety Regulations 2006*.

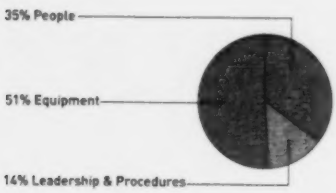
[1] Information Bulletin No. B-05-060408-1—Securing Water Heaters, Date of Issue: April 6, 2006
[2] Information Bulletin No. B-E3-060609-1—Responsibilities of Field Safety Representatives, Date of Issue: June 9, 2006
[3] Directive No. D-E3-060509-2—Supervision Requirements under Electrical Installation Permits, Date of Issue: May 9, 2006

ELECTRICAL

INVESTIGATION OUTCOME OF REPORTED CASES Total number of reported cases = 158


18% Electrical Technology Involvement Ruled Out
16% Undetermined Cause
12% Currently Under Investigation
54% Confirmed Electrical Incidents

ELECTRICAL INCIDENTS BY IDENTIFIED CAUSE Total number of confirmed incidents = 84



In 2006, more than 53,000 installation permits and 6,100 operating permits were registered with the BC Safety Authority. Using our risk-based approach, we identified and inspected work performed under these permits to confirm that the work was done safely and properly.

The Electrical Safety Program oversees electrical safety in the province, including all types of electrical equipment and installations in commercial, industrial and residential sites in accordance with the *Safety Standards Act* and the *Electrical Safety Regulation*. Currently we provide electrical safety services to nearly 1.1 million homes in BC. This excludes homes in Burnaby, Maple Ridge, North Vancouver (City and District), Surrey, Vancouver, Victoria and West Vancouver, since their electrical safety services are provided by their respective municipal governments.

OVERVIEW - 2006

- → Performed over 43,000 inspections
- → 26 percent of our inspections identified at least one non-compliance issue
- → Participation in the Field Safety Representative program increased to approximately 15,000 individuals

INSPECTIONS IN 2006

In 2006, we performed over 43,000 inspections throughout the province. Using our risk-based approach, we targeted installations that posed the greatest threat to public safety, and as a result, we found that in 26 percent of our inspections (11,398 inspections total), at least one non-compliance issue was present. This is consistent with the previous year's findings, where 25 percent of our inspections yielded at least one non-compliance.

One of the major concerns noted during our 2006 inspections is the number of occasions where our Safety Officers identified work performed by people who were either not qualified or did not have the required permits. While our Safety Officers are working together with Field Safety Representatives to ensure that the work performed at permitted sites is being done by individuals with the proper qualifications, the issue of working without a permit is another safety issue on its own.

Electrical work performed without a permit is an issue that we scrutinized more closely in 2006 than ever before. While this is not a new problem, socio-economic factors such as the lack of skilled labour, record levels of construction and high demand for trade-based services have led to more people attempting to either perform the work themselves or to hire individuals who may lack the proper qualifications. Our Safety Officers identified a number of instances in 2006 where work was being completed without a permit, and in many of these cases, the work performed was left in an unsafe condition. In each of these cases, a licenced contractor was called in to correct the unsafe work under a newly issued permit.

INCIDENTS IN 2006

In total, 158 incidents were reported to us in 2006. Further investigations confirmed that 84 incidents were caused by electrical technology, while in 29 cases, electrical technology was ruled out as a factor. In another 25 incidents, the exact cause remains undetermined. Most incidents classified as "undetermined" are the result of not enough evidence remaining from a fire to conclude whether or not electrical technology contributed to these suspected incidents. At the time of publication, we are still investigating 20 incidents.

The leading cause of confirmed incidents involving electrical technology was equipment-related factors, specifically product failure or malfunction. In fact, incidents attributed to product failures or malfunctions accounted for 20 percent of the annual total. A closer examination of these incidents shows that in most cases, contributing factors such as improper maintenance or use of electrical products precipitated these incidents.

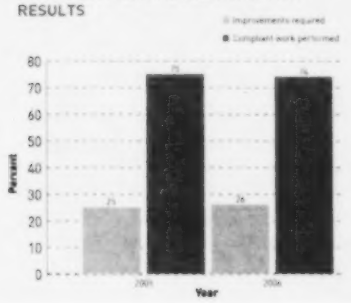
The issue of improper maintenance or use of electrical products is the major trend emerging from our incident data from 2006. For example, common incidents we investigated included fires resulting from people operating clothes dryers with excessive lint build-up or from combustible materials being placed too closely to hot electrical products, such as halogen bulbs and baseboard heaters. These incidents could have easily been avoided if owners had followed simple operating and maintenance guidelines. Most often, we found that people were simply unaware of the maintenance and safety requirements that must be followed when using these products. This is one of the areas that we will focus on as we develop new educational material in the Electrical Safety Program.

"IMPROVING SAFETY THROUGH INNOVATION"

In 1999, nearly 10,000 electrical fires were reported across Canada[1]. These fires are normally caused by an electrical arc, which is an intense burst of electricity that can produce sparks and temperatures of up to 20,000 degrees Celsius. Typically, arcs occur when the insulation on an electrical wire has become brittle, cracked or punctured by objects such as nails and fasteners.

To prevent this hazard, electrical manufacturers developed a new type of breaker called an arc fault circuit breaker. These breakers are fitted with devices that allow them to sense an arc and trip the breaker immediately. Since this technology was released in the late 1990s, the number of electrical fires in Canada has decreased by nearly 25 percent compared to the 10,000 reported in 1999. As more homes and businesses continue to install this technology, the overall risk associated with electrical fires will continue to decrease.

2005 TO 2006 ELECTRICAL INSPECTION RESULTS



OUTCOME	TOTAL NUMBER OF INCIDENTS*	HOUSEHOLD INCIDENTS	INCIDENTS PER 100,000 HOUSEHOLDS	NON-HOUSEHOLD INCIDENTS	INCIDENTS PER 10,000 NON-HOUSEHOLD PERMITS	TOTAL NUMBER OF INJURIES AND FATALITIES
Fatality	1	0	0.00	1	0.18	1
Permanent Injury	4	1	0.09	3	0.53	6
Major Non-Permanent Injury	0	0	0.00	0	0.00	0
Minor Non-Permanent Injury	7	6	0.55	1	0.18	7
Near Miss	117	75	6.92	42	7.44	0
Total	**129**	**82**	**7.56**	**47**	**8.33**	**14**

* Excludes a reported case where follow-up investigation determined that electricity was not involved

IMPROVING PUBLIC SAFETY

Our strategy for improving public safety in 2006 focused on a wide range of participants. Within our organization, we improved Safety Officer training in incident investigation techniques, code changes and general electrical safety issues. Additionally, we audited individual Field Safety Representatives to ensure that the work they are responsible for is being done safely and properly.

In response to the growing number of safety concerns involving non-permitted work, we developed the strategy for a public awareness campaign to be launched in March 2007. This campaign will focus on educating homeowners about the benefits of taking out a permit and will also provide them with information on how to do so. The program was initially implemented in the Okanagan Valley as a pilot project and, following a successful trial, will be rolled out to other communities.

FUTURE OUTLOOK AND CHALLENGES

One of our biggest challenges is controlling the amount of unsafe and non-permitted work being performed in the province. Work that is performed without a permit is not accounted for within the safety system and we are therefore unable to inspect or audit any of this work. This is a significant safety issue for all people who use these electrical installations, and in particular, for homeowners who unknowingly purchase homes where potentially hazardous non-permitted electrical work was completed.
To counteract this issue, we will continue to expand our public awareness campaign in 2007 while also engaging in in-depth research and analysis of non-permitted work and the factors that contribute to its prevalence. In addition, we will be working with the insurance and real estate industries to minimize risk uncertainty on property transfer.

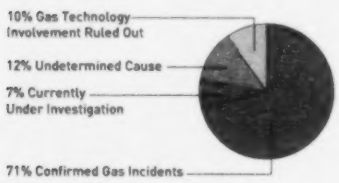
In recent years, we have seen a proliferation in the number of counterfeit and sub-standard electrical products being sold or imported into this province. While these products are generally sold to the public at discount prices, the discounts come at a direct cost to public safety. This is a serious issue that is becoming more difficult to control given the level of sophistication of the counterfeiters' production methods and the simple fact that the average consumer is unaware of the safety issues surrounding counterfeit products.

Today we are addressing the problems associated with counterfeit and substandard goods through a number of methods. First, our Safety Officers have stepped up enforcement and can order that unsafe products be removed from sale. Second, we have held discussions with various stakeholders with the intent of lobbying customs and enforcement agencies to actively search out and restrict the illegal importation of counterfeit goods. Lastly, in an effort to raise awareness among the general public and our clients, we issued a directive[2] that outlined exactly which electrical certification marks are recognized for use in BC.

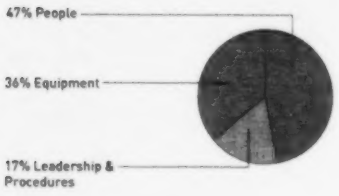
[1]Source: Annual Reports 1986-2002 Fire Losses in Canada, Council of Canadian Fire Marshals and Fire Commissioners, March 2007 (Table 5—Fire Losses by Source of Ignition)
[2]Directive No. D-E3 060414 1 - Approved Certification Marks for Electrical Products. Date of Issue: April 14, 2006

GAS

INVESTIGATION OUTCOME OF REPORTED CASES Total number of reported cases = 59


10% Gas Technology Involvement Ruled Out
12% Undetermined Cause
7% Currently Under Investigation
71% Confirmed Gas Incidents

GAS INCIDENTS BY IDENTIFIED CAUSE
Total number of confirmed incidents = 42



In 2006, over 38,000 installation and 2,100 operating permits were issued by the Gas Safety Program at the BC Safety Authority. These included installation permits for certified equipment such as residential hot water tanks, commercial ovens and industrial air handling units.

The *Gas Safety Program* regulates safety in gas distribution, and specifically the use of natural, propane, digester, landfill and hydrogen gas (and the manufacturing or dilution of any of them). The program also regulates the safe installation and operation of gas-fuelled equipment in accordance with the *Safety Standards Act* and the *Gas Safety Regulation*. Currently we provide gas safety services to over 1.2 million homes in BC. This excludes homes in Burnaby, Kelowna, Maple Ridge, North Vancouver (City and District), Richmond and Vancouver, since their gas safety services are provided by their respective municipal governments.

OVERVIEW - 2006

- → Administered licensing and certification for 2,100 gas contractors and 14,000 gas fitters in the province
- → Performed over 16,000 inspections
- → Identified at least one non-compliance issue in 28 percent of our inspections

INSPECTIONS IN 2006

Using our risk-based inspection program, we performed more than 16,000 targeted inspections in 2006. Our inspections found that in 28 percent of these installations, or over 4,500 separate cases, a non-compliance issue was identified and assigned for further safety improvement. This is a significant increase over the previous year, when approximately 19 percent of our inspections identified a non-compliance issue.

A closer look at our inspection data shows that while the number of non-compliant inspections increased, the majority were not serious in nature and hence did not place the public in an immediate risk for harm. In many cases, our Safety Officers noted that the non-compliances related to a lack of training with respect to recent advancements in new gas equipment. These changes in technology required certain modifications to the setup and installation procedures for these products. As a result, most of the non-compliances could be traced back to a lack of knowledge, training or awareness on the part of the gasfitter.

INCIDENTS IN 2006

In total, 59 incidents were reported to us in 2006. Further investigations confirmed that 42 incidents were caused by gas technology, while in six cases, gas technology was ruled out as a factor. In another seven incidents, the exact cause remains undetermined. Most incidents classified as "undetermined" are the result of not enough evidence remaining from a fire to conclude whether or not gas technology contributed to these suspected incidents. At the time of publication, we are still investigating four incidents.

People-related factors were the leading cause of confirmed gas incidents in 2006. In particular, human error was cited as the main cause of 47 percent of all incidents and was either suspected or contributed in another 14 percent. During investigation, our Safety Officers found that most people involved were either not aware or did not fully appreciate the importance of taking proper precautions when working with or around active gas equipment. An example of this type of incident, which arose on multiple occasions throughout the year, is a line-hit.

A line-hit occurs when an underground gas line has been struck or punctured. While there are approximately 1,800 line-hits reported annually, these incidents are normally handled by the gas utilities and then reported to the BCSA. In the most serious cases, our organization will intervene and provide investigative services when it is determined that public safety has been jeopardized. In most of these instances, our Safety Officers found that the individuals responsible for the line-hit did not take the proper safety precautions before digging. Based on the circumstances of each case, we apply a balance of education and enforcement to the individual responsible so that we can prevent a recurrence.

IMPROVING PUBLIC SAFETY

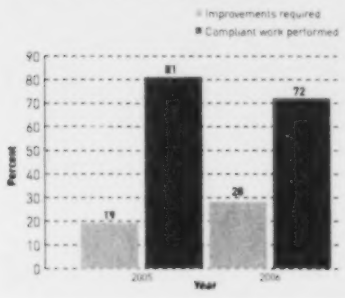
Our approach to improving public safety in 2006 focused on leveraging education and outreach opportunities among our stakeholders.

We developed and delivered educational safety messages to the public and our stakeholders through various speaking engagements, posting information on our website and publishing material in traditional print media. Moreover, we issued four Information Bulletins during the year to address various safety topics, including the adoption of regulatory code supplements,[4] changes to plastic

"PARTNERING FOR A SAFER BC"

There are over 800,000 recreational vehicles (RVs) travelling on Canadian roads every year, with the vast majority equipped with their own liquid propane gas system for cooking and heating. While these types of gas systems are quite safe, they require regularly scheduled maintenance and inspections. This is important because without proper maintenance, the gas systems can be hazardous for everyone who shares the road and campgrounds with these vehicles. Realizing this risk, we partnered with the Motor Vehicle Sales Authority of British Columbia during the year and developed a program that will ensure RVs commercially sold in the province are inspected and certified as being Gas Safe. Through this initiative, RV users will be able to ensure the gas system in their new RV is safe and reliable.

2005 TO 2006 GAS INSPECTION RESULTS



OUTCOME	TOTAL NUMBER OF INCIDENTS*	HOUSEHOLD INCIDENTS	INCIDENTS PER 100,000 HOUSEHOLDS	NON-HOUSEHOLD INCIDENTS	INCIDENTS PER 10,000 NON-HOUSEHOLD PERMITS	TOTAL NUMBER OF INJURIES AND FATALITIES
Fatality	1	0	0.00	1	0.18	1
Permanent Injury	2	1	0.09	1	0.18	2
Major Non-Permanent Injury	2	1	0.09	1	0.18	6
Minor Non-Permanent Injury	15	5	0.46	10	1.77	23
Near Miss	33	13	1.20	20	3.54	0
Total	**53**	**20**	**1.84**	**33**	**5.85**	**32**

* Excludes a reported case where follow-up investigation determined that gas technology was not involved.

venting requirements[7] and maintenance of bakery ovens[8]. We also issued a Safety Order[9] regarding the inspection and servicing of a particular make and model of bakery oven following an incident that resulted in numerous injuries.

To prevent incidents before they happen, we developed an evaluative process to pre-screen permit applications from members of the general public. This screening process scores the applicant on a series of questions designed to determine if they have the minimum knowledge requirements needed to safely work on their gas system. The result is that certain applicants who may not be able to adequately perform the work are encouraged to hire a licenced contractor. This process has allowed us to identify high-risk installations and intervene before the work is performed. Pilot runs of this pre-screening process on Vancouver Island and the Southern Interior have been successful, and as a result, we have expanded this service to other communities in BC.

During 2006, we engaged our stakeholders through a series of contractor meetings designed to gain their insight into various safety issues affecting the gas industry. We had a strong turnout and we consulted with over 800 representatives, from both small and medium-sized firms and large multinational corporations. The feedback we received from these consultations influenced how we apply our policies for different geographic regions in the province. After all, the effect of cold weather on a gas system in northern BC, where temperatures can easily dip below -30 degrees Celsius during the winter months, will be different than an area such as the Southern Coast, which typically records winter temperatures nearing zero degrees Celsius.

Aside from education and outreach, we have actively represented BC for engineering-based work on national and technical code committees. Through our involvement, we have enhanced installation and operation codes to better reflect industry changes brought on by new technologies and innovations.

FUTURE OUTLOOK AND CHALLENGES

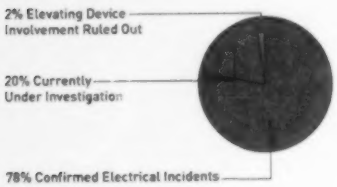
Similar to the trends we have seen in other technologies, the rate of technological change in the gas industry is faster than the rate at which we are training and upgrading the skills and knowledge of those who are actually installing these products. As mentioned earlier, we have seen this trend start to affect the results of our inspection data; accordingly, this underscores how important it is for a gasfitter to continuously maintain his or her knowledge of current codes and regulations.

The general lack of public awareness about the safe usage and handling of gas equipment is an issue. A number of incidents reported to us could have been avoided had basic precautions been observed. Long-standing safety concerns that dominated 2006 include the unsafe handling of propane tanks, people excavating land without checking for active gas lines and a lack of understanding about the sources and dangers of carbon monoxide. Our challenge in the coming years is to develop effective strategies and partnerships with industry associations to raise gas safety awareness in both the general public and those working within the industry.

[7] Information Bulletin No. B-G5 061206.3—Adoption of 2007 Supplements to the CSA B149 Codes. Date of Issue: December 6, 2006.
[8] Information Bulletin No. B-G5 061206.4—Changes to Plastic Venting Requirements. Date of Issue: December 6, 2006.
[9] Information Bulletin No. B-G5 060519.2—Installation and Preventative Maintenance for Gas-Fired Rack Bakery Ovens. Date of Issue: May 19, 2006.
[10] Safety Order No. SO-G5 060829.3—Inspection and Servicing of Revent Gas Bakery Ovens. Date of Issue: August 29, 2006.

ELEVATING DEVICES

INVESTIGATION OUTCOMES OF REPORTED CASES Total number of reported cases = 60



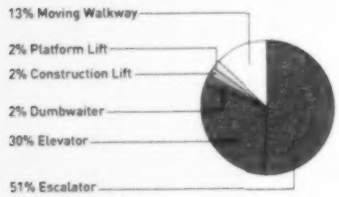
The BC Safety Authority is responsible for overseeing the safety of elevators, escalators, moving walkways, dumbwaiters, lifts and construction hoists in accordance with the *Safety Standards Act* and the *Elevating Devices Safety Regulation*.

There were nearly 22,000 elevating devices registered with the BC Safety Authority in 2006. This number includes both previously existing units and new units that were installed in 2006.

OVERVIEW - 2006

- → Administered the registration of nearly 22,000 elevating devices in 2006
- → Performed nearly 2,100 inspections on new and existing units
- → Required that over 4,000 safety enhancements be made to new units and existing units

EQUIPMENT INVOLVED IN ELEVATING DEVICE INCIDENTS Total number of confirmed incidents = 47



INSPECTIONS IN 2006

In 2006, our Safety Officers conducted nearly 2,100 inspections on newly installed and existing elevating devices. We made it a practice to inspect all newly installed elevating devices so that we can identify code violations prior to the unit being certified for operation. For units already installed, we use a risk-based approach to identify high-risk units for physical inspection.

On average, our Safety Officers identified 1.93 non-compliance issues per inspection, an increase over the previous year's average of 1.68. The change in the 2006 non-compliance figure is linked to a gradual shift in our inspection activity. Over the course of the year, we refocused our inspections to better reflect the risk that certain units pose to the general public. As a result, we conducted more inspections on older units that are still in operation as opposed to focusing primarily on newly installed units. Preliminary analysis of our 2006 inspection data suggests that current operating units tend to have more non-compliances than newly installed units; however, these non-compliances are, for the most part, relatively minor.

INCIDENTS IN 2006

In 2006, we received 60 incident reports from our stakeholders. Further investigations confirmed that 47 incidents were caused by an elevating device, while in one case, the technology was ruled out as a factor. At the time of this publication, 12 incidents were still under investigation, although preliminary reports for each of these cases have determined that an elevating device was directly involved with the incident.

When separated by specific technology, we found that escalators were involved in most incidents, accounting for 31 of the 59 incidents. In all but two of these escalator incidents, an injury resulted, although most injuries were minor cuts and scrapes sustained during a fall. As is the trend from previous years, the leading cause of escalator incidents was a lack of attention while either loading or unloading from the escalator. In prior years, the second leading cause of escalator incidents was from an object (such as carts, strollers and bikes) falling down an escalator; in 2006, on the other hand, the second leading cause of an incident was people tripping and falling while running up the escalator.

During the year, another 13 of the 59 incidents involved an elevator. Equipment-related issues, such as product malfunctions or failures, were attributed as either the main cause or a contributory factor in each of these incidents. People-related factors did play a role in these incidents as well—46 percent of elevator incidents involved people tripping and falling while entering or exiting the elevator.

IMPROVING PUBLIC SAFETY

Throughout 2006, the Elevating Devices Safety Program focused on three initiatives to improve public safety: confirming the status of decommissioned units, increasing enforcement for mandatory maintenance requirements and researching professional standards for elevating-device mechanics.

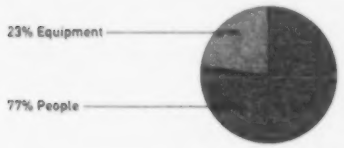
Following up on work originally developed in 2005, we initiated a program to confirm the records of previously decommissioned elevating units and inspect each one to ensure that they remained shut down and secured. By doing so, we were able to decrease the uncertainty around whether these units still posed a risk to the public.

"WORKING TOGETHER FOR SAFETY"

Elevators, escalators and moving walkways move more than 210 billion passengers each year in Canada and the US. Although the number of people injured while using these devices is relatively low, the fact is that many of the injuries are avoidable. That's why, in 2006, we worked together with industry and local governments to help raise awareness of the risks involved with using elevators and escalators.

Through a partnership with the Elevator Escalator Safety Foundation we distributed educational packages to approximately 5,500 primary school students in BC. These packages included workbooks, videos and interactive guides to reinforce common safety messages such as "Remember to hold onto the handrail" and "Watch your step when getting on and off of the escalator." Moreover, by working with local governments we were able to have a number of cities, including Burnaby, Surrey and Vancouver, declare November 12 to 18 as Elevator and Escalator Safety Week.

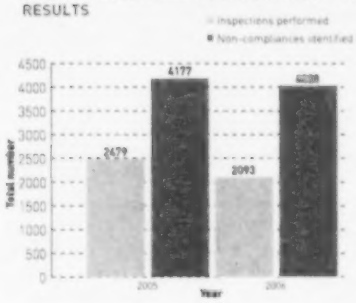
ELEVATING DEVICE INCIDENTS BY IDENTIFIED CAUSE Total number of confirmed incidents = 47



OUTCOME	TOTAL NUMBER OF INCIDENTS*	INCIDENTS PER 1,000 OPERATING PERMITS	TOTAL NUMBER OF INJURIES OR FATALITIES	INJURIES PER 1,000 OPERATING PERMITS
Fatality	0	0.00	0	0.00
Permanent Injury	0	0.00	0	0.00
Major Non-Permanent Injury	6	0.31	6	0.31
Minor Non-Permanent Injury	39	2.03	39	2.03
Near Miss	14	0.73	0	0.00
Total	**59**	**3.07**	**45**	**2.34**

* Excludes a reported case where follow-up investigation determined that elevating technology was not involved.

2005 TO 2006 ELEVATING DEVICE INSPECTION RESULTS



For existing elevating devices, we increased enforcement to target unit owners who may have failed to renew their mandatory maintenance contracts or even establish one in the first place. Under regulations, every elevating device must be registered and maintained according to a specific maintenance contract. In 2006, we initiated an ongoing campaign to bring these units back into compliance.

One of the biggest initiatives we have undertaken in recent years is developing professional standards for elevating device mechanics. Currently, the elevating industry relies on individual training programs developed by individual contractors and vocational schools to train mechanics. However, these programs lack a standardized set of principles that can be applied to any elevating device in this province. In 2006, we focused on researching and analyzing this issue so that we can begin addressing the current and future training and certification needs of this industry.

FUTURE OUTLOOK AND CHALLENGES

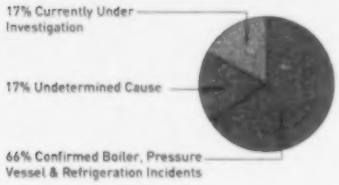
Advances in technology have made new elevating devices considerably safer than those already in service. One of our biggest challenges is to bring units already in service up to the level of safety seen in newer devices. As we have done in 2006—and will continue to do so in the coming years—we are refocusing the Elevating Devices Safety Program to include more inspections on existing units. As we move forward in 2007, we will concentrate our resources on the area that poses the greatest threat to public safety: units that are currently in use but nearing the end of their lifespan.

Similar to the trends in other trade-based industries, it is becoming increasingly difficult to recruit and retain skilled labour in the elevating industry. This has serious implications for the elevating industry in BC, which has a number of contractors who are struggling to meet the obligations of some of their maintenance contracts due to poor contract management and deep discounts. As a result, we have noticed that some contractors are targeting the booming construction market and placing a higher priority on installing new elevating units rather than maintaining safety standards on those already in service.

To counteract some of these issues, we are helping the industry move towards developing professional standards and certifying their mechanics. By doing so, we are engaging the industry in taking an active role in providing safety for the people who work and use their products. The end result will be that these standardized set of qualifications will essentially lead to a system where the industry takes responsibility for training its own highly skilled individuals who can perform inspections on work completed by their counterparts.

BOILERS, PRESSURE VESSELS AND REFRIGERATION UNITS

INVESTIGATION OUTCOME OF REPORTED CASES Total number of reported cases = 6

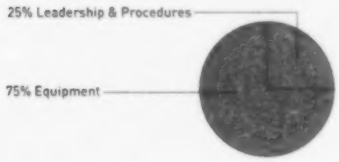

17% Currently Under Investigation
17% Undetermined Cause
66% Confirmed Boiler, Pressure Vessel & Refrigeration Incidents

The Boiler and Pressure Vessel Safety Program oversees the safety of new and existing pressure equipment and boilers under the *Safety Standards Act* and the *Power Engineers, Boiler, Pressure Vessel and Refrigeration Safety Regulation*. Pressure equipment includes high and low pressure boilers, hot water boilers, refrigeration units, and fired and unfired pressure vessels. In addition to ensuring the safe operation of pressure equipment, we review new boiler and pressure vessel designs to make sure they meet safety code requirements.

OVERVIEW - 2006

- → Administered registration for over 78,000 boilers and pressure vessels in 2006
- → Performed nearly 12,000 inspections
- → Signed an Equivalent Standards Agreement with Encana Corporation

BOILER, PRESSURE VESSEL & REFRIGERATION INCIDENTS BY IDENTIFIED CAUSE
Total number of confirmed incidents = 4



INSPECTIONS IN 2006

In 2006, our Safety Officers performed nearly 12,000 inspections on boilers, pressure vessels and refrigeration units. Under our risk-based approach, we focused on high-risk installations and operations that need periodic inspection services. Most non-compliance issues found during an inspection result in the immediate shutdown and maintenance of the unit. As such, the issue is corrected before the Safety Officer leaves the premises and hence the non-compliance is not reflected in the Certificate of Inspection.[10] For this reason, the number of non-compliances identified by our Safety Officers is not accurately reported at this time.

A closer look at our inspection activity shows that maintenance-related issues are the most common risk factors for this technology. For boiler equipment, the main issue is improper maintenance of the equipment. This is a concern, because improper maintenance is often cited as one of the leading contributory causes of incidents within this technology.

For pressure vessels, a public safety issue that we identified in 2006 is the use of air receivers. An air receiver is a pressure vessel specifically designed and constructed to store compressed air. A common example of an air receiver is an air compressor, which is typically sold at home improvement stores for personal use. While there are thousands of these devices throughout the province, many of the owners and operators remain relatively unaware of the safety precautions that must be followed while using and maintaining this equipment.

Lastly, with respect to refrigeration technology, we have found that procedural errors are the most common type of maintenance issues being observed by our Safety Officers. While the majority of refrigeration systems are well maintained, when an incident does occur, it is normally attributed in some part to people-related procedural errors rather than equipment-related factors.

INCIDENTS IN 2006

We received six incident reports from our stakeholders in 2006. Among these incidents, three involved a boiler, one a pressure vessel unit and another two involved refrigeration technology. At the time of this report, one incident was still under investigation.

Equipment failure was cited as the leading cause of incidents for this technology. In two cases, product failure was suspected as the main cause, while another incident resulted from violations in the operator's preventative maintenance program. In the other two incidents, further investigation found that one was the result of a code violation during maintenance while the other was ultimately classified as undetermined.

[10] A Certificate of Inspection is a report completed by a Safety Officer to document the inspection of regulated work and/or products.

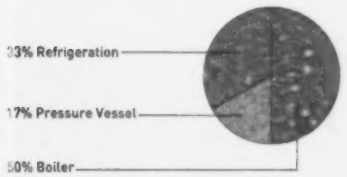
"BUILDING ON OUR KNOWLEDGE"

One of the ways to prevent future accidents is to learn from the past.

In 2004, a boiler exploded on the main campus of the British Columbia Institute of Technology. Our analysis of this incident uncovered a number of key indicators that would allow us to improve our inspection program and identify which units were more susceptible to failure. The safety improvements we gained from this knowledge came very quickly.

One case that stands out in 2006 is an inspection of a boiler at a Sechelt hospital. The boiler was targeted by our Safety Officers because it was similar in make, model and age to the one involved in the BCIT incident. Upon inspection, our Safety Officer saw a number of the key indicators that led him to believe that this boiler would fail much like the BCIT boiler. Further testing confirmed his analysis, and as a result, we were able to eliminate this risk and prevent a serious incident from occurring.

EQUIPMENT INVOLVED IN BOILER, PRESSURE VESSEL & REFRIGERATION INCIDENTS
Total number of incidents = 6



OUTCOME	TOTAL NUMBER OF INCIDENTS	INCIDENTS PER 10,000 OPERATING PERMITS	TOTAL NUMBER OF INJURIES OR FATALITIES	INJURIES PER 10,000 OPERATING PERMITS
Fatality	0	0.00	0	0.00
Permanent Injury	0	0.00	0	0.00
Major Non-Permanent Injury	0	0.00	0	0.00
Minor Non-Permanent Injury	1	0.18	1	0.18
Near Miss	5	0.91	0	0.00
Total	**6**	**1.09**	**1**	**0.18**

IMPROVING PUBLIC SAFETY

The Boiler and Pressure Vessel Safety Program focused on two key areas to improve public safety in 2006—inspecting firetube steam boilers and partnering with other organizations to make users aware of the risks associated with improperly maintained air receivers.

During the year, our inspection data identified over 1,800 high-risk firetube steam boilers that required additional inspections. Following the inspections, we found a number of units that had to be either immediately shut down and placed into maintenance or replaced entirely. This included two cases where boiler units were replaced in public institutions after our Safety Officers identified critical issues with their existing systems.

The other initiative we focused on this year was educating owners and operators of air receivers about proper safety precautions and inspection requirements. We worked together with Human Resources & Social Development Canada, the Automotive Retailers Association and WorkSafeBC to publicize and raise this issue with owners and operators of air receivers. While we have contacted many of the registered owners of this equipment, we are continuing to develop more effective strategies to control the risk of some air receivers that may not be registered and hence not inspected.

FUTURE OUTLOOK AND CHALLENGES

Reduced budgets and a limited number of resources are recurring themes that have continued to plague many public institutions over the past few decades. A number of institutions, including hospitals and schools, are struggling to adequately maintain key components of their infrastructure. This is particularly concerning for boilers, which require consistent maintenance and investment to keep the technology operating safely. In the coming years, we will be working in partnership with other organizations to bring effective resources to these operations that will enhance their safety, and in turn reduce the potential risk posed by these units.

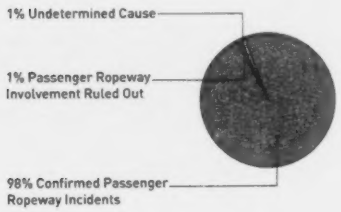
On the technology front, we expect an increase in the number of operations converting to wood-fired boiler technology. Using a wood-fired boiler is currently one of the most economical alternatives for power production and wood drying given the relatively high cost of fossil fuels and the overabundance of wood destroyed by the pine beetle infestation in BC. In fact, in 2006 a number of operations converted to wood-fired boilers to dry lumber, heat greenhouses and generate power.

One of the upcoming challenges that will affect the industry is the movement towards objective-based safety management. Under this type of system, owners and operators would continue to play a central role in ensuring the safety of their equipment. We foresee this having the greatest impact on large organizations, which will now have the flexibility to make innovative safety enhancements to their pressure equipment as long as they meet the minimum safety standards. Much of this will be done through the expansion of our Equivalent Standards Agreement program.

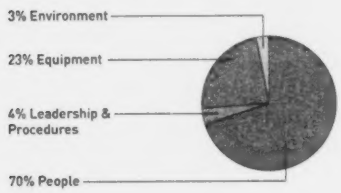
In addition, starting in 2007, we will be working to improve incident reporting for this industry. The number of reported incidents from equipment owners, operators and contractors does not represent the actual number of incidents and the industry's level of safety. By collecting more incident data, we will be able to improve safety in this industry.

PASSENGER ROPEWAYS

INVESTIGATION OUTCOMES OF REPORTED CASES Total number of reported cases = 135



PASSENGER ROPEWAY INCIDENTS BY IDENTIFIED CAUSE
Total number of confirmed incidents = 133



The BC Safety Authority's Passenger Ropeways Safety Program oversees the safety of 256 active passenger ropeway units in 48 different locations across the province. Examples of passenger ropeways include tramways, gondolas, chairlifts, T-bars, rope tows and conveyors. We inspect existing, new and modified units in accordance with the *Safety Standards Act* and the *Elevating Devices Safety Regulation*.

OVERVIEW - 2006

- → Administered the registration of 256 units installed in 48 locations throughout British Columbia
- → Serviced approximately 5.7 million skier days in 2007
- → Benefited from the strongest incident reporting and data collection methods in the BC Safety Authority

INSPECTIONS IN 2006

The bulk of our inspection activity is normally seen in the late fall when equipment is tested before commissioning for the ski and snowboard season. While the 2005/2006 season was relatively mild, the 2006/2007 season started off very strong due to record snowfalls in October and early November. In fact, with the 2006/2007 ski and snowboard season starting earlier than normal—and the construction of new passenger ropeway installations moving forward at a rapid pace—it was necessary to increase our staffing levels to accommodate the increased demand.

In 2006, our Safety Officers performed 210 inspections and consequently uncovered 1,119 non-compliance issues. That is an average of 5.33 non-compliance issues per inspection, which is a minor increase over the previous year's average of 4.89. However, as in 2005, most non-compliances found in 2006 were mainly operational in nature, indicating a need for further training and a review of the safety procedures taken by some operators.

INCIDENTS IN 2006

In total, 135 incidents were reported to us in 2006. Further investigations confirmed that 133 incidents were caused by passenger ropeway technology, while in one case, the technology was ruled out as a factor. Additionally, the exact cause of another one case remains undetermined due to a lack of sufficient evidence.

With the 2006/2007 ski and snowboard season starting very early in November 2006, we expected that the number of incidents we would see reported for the year would increase dramatically. We found that the number of incidents reported in November, which has traditionally had moderate levels of reported incidents, was as substantial as the number of incidents we generally see during the peak months of December and January.

A majority of the 133 confirmed incidents involved a passenger falling while loading or unloading from a carrier. Taking into account the wide range of passengers' skill levels on skis and snowboards, it is not uncommon to see these falls as the leading type of incident among most passenger ropeway installations.

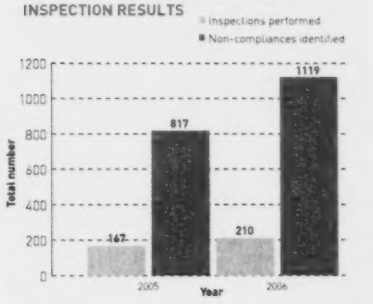
Interestingly, in late 2006 we started to notice a rise in the number of passengers falling from carriers outside the general vicinity of either the loading or unloading areas. Further investigation found that in many of these cases, younger children were falling from the carrier as a result of inappropriate behaviour. We have monitored this trend closely and have brought it to the attention of individual operators. By doing so, we are working with ropeway operators to educate parents, guardians and snow school instructors about the importance of teaching, following and enforcing safe behaviours while riding chairlifts.

"MAKING SAFETY A PRIORITY"

With only 48 locations and 256 units across the province, the Passenger Ropeway Safety Program received more incident reports in 2006 than three of our largest technologies combined. While people might assume that high numbers of incident reports are cause for alarm, this is not at all the case.

Unlike the other technologies, there is a very strong culture among Passenger Ropeway operators to report incidents. By doing so, each of these operators contributes a small part to the overall data we use to forecast trends and identify the common safety problems that may affect their operations. Among the sectors we oversee, the passenger ropeways industry has consistently demonstrated how individual operators doing their part to participate in the safety system can together make a big difference in improving public safety. The passenger ropeways sector—and the ski industry in general—deserve recognition for their culture of data capture and learning from incidents.

2005 TO 2006 PASSENGER ROPEWAY INSPECTION RESULTS



OUTCOME	TOTAL NUMBER OF INCIDENTS*	INCIDENTS PER 100,000 SKIER DAYS	TOTAL NUMBER OF INJURIES OR FATALITIES	INJURIES PER 100,000 SKIER DAYS
Fatality	0	0.00	0	0.00
Permanent Injury	0	0.00	0	0.00
Major Non-Permanent Injury	3	0.05	3	0.05
Minor Non-Permanent Injury	23	0.40	23	0.40
Near Miss	108	1.89	0	0.00
Total	**134**	**2.34**	**26**	**0.45**

* Excludes a reported case where follow-up investigation determined that passenger ropeway technology was not involved.

IMPROVING PUBLIC SAFETY

Among all of the incidents reported in 2006, one resulted in a Safety Order[11] being issued. In this case, a detachable grip and hanger assembly began to separate and resulted in an automatic shutdown of the ropeway. Further investigation by our Safety Officers revealed that the grip components separated due to an incorrect maintenance procedure. We used our Safety Order to advise other operators of this unsafe practice and followed up with mandatory inspections for all units. In the end, this Safety Order identified a number of grips that were also incorrectly maintained and hence had the very real potential for further injury if the issue had not been identified and corrected.

In addition, we have been working with the members of our industry technology committee and with associations, such as the Canada West Ski Areas Association, to help improve the level of safety for riders, operators and mechanics. With their cooperation, we have made significant progress in improving public safety. Successes include the quick implementation of rider education programs designed to mitigate the risk of falling from a carrier and the strong level of participation by each operator to report incidents, which is the main reason why incident data for this technology is relatively high when compared to the other technologies we regulate.

Lastly, an industry-led initiative we have been working on in 2006 that will carry forward into 2007 is developing safety management plans for each operation. Establishing these safety management plans is important because they will have considerable safety implications in the coming years. Long-standing issues, such as maintenance worker requirements and contractor safety training, will be addressed by the plans developed by each passenger ropeway operator. In 2006, we invested research and resources to develop the framework for these Safety Management Systems in consultation with the industry.

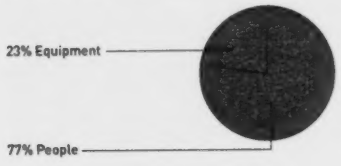
FUTURE OUTLOOK AND CHALLENGES

As the 2010 Olympic and Paralympic Winter Games draw near, we are starting to see an increased level of construction for new passenger ropeway installations. In fact, three new ropeway installations will be constructed for athletes from various nations who will be training throughout BC in preparation for these games. Aside from the additional demand created by the Olympics, the passenger ropeway industry was already rapidly expanding to keep up with demand from locals and tourists.

Moving forward into 2007, we also face the challenge of successfully integrating Safety Management Systems for all the passenger ropeway installations throughout the province. While the template has been established, our goal is to work with the industry to ensure that the system it creates is both sustainable and results in greater levels of safety.

[11] Safety Order No. SO-P4-060117-1 – Visual Inspection of Doppelmayr DT-104 Detachable Grips. Date of Issue: January 17, 2007.

AMUSEMENT DEVICES



The BC Safety Authority oversees the safety of amusement device installations and operation in accordance with the *Safety Standards Act* and the *Elevating Devices Safety Regulation*. This includes fixed and portable amusement rides, waterslides and large roller coasters. In 2006, there were 487 amusement rides registered with the BC Safety Authority, of which 318 were active while the remaining 169 were either shut down or dismantled.

OVERVIEW - 2006

- → Oversaw 318 active amusement devices in operation in 2006, which includes amusement devices that travel between provinces
- → Performed nearly 250 inspections in 2006
- → No serious injuries or fatalities resulted from an incident

INSPECTIONS IN 2006

During the year, Safety Officers performed 244 amusement device inspections and identified 197 non-compliance issues. Both the number of inspections and non-compliance issues increased over the previous year as a direct result of the two additional Safety Officers added to this technology.

The average inspection uncovered 0.81 non-compliances. While this is an increase over the previous year's figure of 0.66 non-compliances per inspection, it comes as a result of the increased number of inspections performed and the fact that we heavily focused on a particular type of amusement device (waterslides) this year.

One of our major initiatives for 2006 was to establish a baseline status for all waterslides in BC. We inspected every flume at all 84 waterslide locations throughout the province, and we were able to use this information to create and distribute an Information Bulletin[12] regarding waterslide safety.

INCIDENTS IN 2006

In 2006, we had 13 amusement device related incidents reported to us by members of the public, amusement ride contractors and owners. The higher number of reported incidents compared to the previous year results from our continued focus on building relations within the industry and improved reporting from both the general public and waterslide operators.

There were 11 minor injuries sustained on amusement devices in 2006. Nine of these injuries were the direct result of human error. Most of these nine human error related injuries were avoidable, but occurred when passengers knowingly overlooked or thwarted safety precautions by undoing seat belts or travelling faster than normal.

The other two injuries resulted from equipment failure. In one case, a child sustained a minor sprain and bruising when he was thrown from a ride. This incident was originally reported by a concerned parent. An investigation uncovered that the incident resulted from product malfunction; however, when followed up by our Safety Officer, the amusement ride had already left the province. Our Safety Officers tracked down this amusement ride and contacted the local safety authority where the ride was scheduled to make its next appearance. We provided this safety authority with our findings about the particular unit so that it could take action and secure the safety of the ride before another accident could occur, regardless of its location.

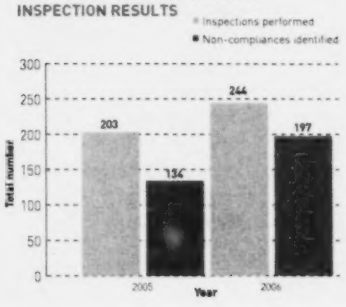
[12]Information Bulletin No. B-P4 060714 1 – Water Circulation Inlets in Waterslide Pools: Operation and Maintenance Requirements. Date of Issue: July 14, 2006.

"LEARNING FROM EVERY INCIDENT"

In July 2006, a seven-year-old child lost both of his legs when he was suddenly sucked into a pipe at a waterslide pool in Quebec. Upon inspection, it was found that the water park visited by the child had 24 safety violations.

While this incident occurred halfway across Canada, we wanted to take action to prevent a similar incident from occurring here in BC. In 2006, we initiated a comprehensive safety review of water parks throughout BC that included inspecting all waterslide flumes and educating operators about proper safety precautions. More waterslide operators are sharing their incident reports with us, and together, we can use the knowledge we gain from their incident data to create a safer experience for every waterslide guest, inside and outside BC.

2005 TO 2006 AMUSEMENT DEVICE INSPECTION RESULTS



OUTCOME	TOTAL NUMBER OF INCIDENTS	INCIDENTS PER 100 OPERATING PERMITS	TOTAL NUMBER OF INJURIES OR FATALITIES	INJURIES PER 100 OPERATING PERMITS
Fatality	0	0.00	0	0.00
Permanent Injury	0	0.00	0	0.00
Major Non-Permanent Injury	0	0.00	0	0.00
Minor Non-Permanent Injury	11	3.46	11	3.46
Near Miss	2	0.63	0	0.00
Total	**13**	**4.09**	**11**	**3.46**

IMPROVING PUBLIC SAFETY

We took a number of steps to improve the overall level of safety in the Amusement Device technology area. As mentioned earlier, we increased the number of Safety Officers working in this technology so that we could provide greater service to our stakeholders. In addition, we have been monitoring incident reports throughout Canada and the US for possible safety hazards. This led to a number of targeted inspection campaigns on specific types of rides, such as waterslides and inflatable rides.

Throughout the year, we placed a considerable effort on fostering better relations with amusement device operators and owners. This included actively seeking out new members for our technology committee while meeting with various industry associations throughout the year.

In 2006, we continued to educate people operating within this technology area and emphasized the necessity of having proper licences and permits with all of our contractors, operators and owners. This not only gives them access to the extensive knowledge and expertise of our Safety Officers, but also helps to create a safe and fair competitive market between amusement ride contractors.

FUTURE OUTLOOK AND CHALLENGES

Currently, the amusement device industry in BC adheres to the Canadian Standards Association code Z267-00: Safety Code for Amusement Rides and Devices; however, there is no standardized code between Canada and the United States. This is an issue that we have been working to resolve over the past year as there are many amusement device operators who travel extensively throughout Canada and the US. Establishing a single set of code requirements will remove much of the ambiguity about the safety requirements in different communities, provinces and states throughout North America. We will pursue this initiative in 2007.

As we continue to develop the Amusement Device Safety Program, we will be focusing on expanding education and outreach opportunities with the contractors and owners of these devices. This includes delivering educational safety programs in partnership with operators, such as our upcoming waterslide operational safety program that will target procedural and training issues relating to waterslides and water parks.

RECREATIONAL RAILWAYS

RECREATIONAL RAILWAY INCIDENTS BY IDENTIFIED CAUSE
Total number of incidents = 3

BC's recreational railways industry is made up of 19 operations ranging from a miniature 10-inch gauge train to full historical steam trains operating on tracks with lengths varying from 0.8 km to 15 km. Most of these operations are popular tourist attractions and family-oriented railways that include the miniature railway in Vancouver's Stanley Park, the Galey Farms Railway in Victoria and the Fort Steele Railway in Cranbrook.

The BC Safety Authority oversees the safety of recreational railway operations and maintenance in accordance with the *Safety Standards Act* and the *Elevating Devices Safety Regulation*.

OVERVIEW - 2006

- → Eighteen active and one inactive recreational rail operations
- → Transported approximately 560,000 passengers in 2006
- → Average recreational railway operated for 130 days during 2006

INSPECTIONS IN 2006

With only 18 active operations throughout the province, we were able to perform 56 inspections in 2006. As part of their inspection program, recreational railways are subject to a minimum of three separate types of inspections focused on mechanical systems, operations and infrastructure (track).

Our Safety Officer found a total of 150 non-compliances this year, which averages out to 2.68 non-compliances per inspection. This is a considerable increase compared to the previous year, when an average of 0.61 non-compliances was observed. The increase in non-compliances directly results from our initiative to increase scrutiny on infrastructure (track) for the year. This explains why, in 2006, infrastructure issues were the more prevalent type of non-compliances cited by our Safety Officer, while those relating to mechanical systems and operations were relatively low.

While many non-compliances resulted from a change in the focus of our inspection activity, we are finding that these non-compliances are indicative of the broader under-investment issue that continues to afflict this industry. Maintaining infrastructure (track) requires constant investment and monitoring; without it, the risk to public safety increases.

Another issue uncovered by our inspections is the growing reliance on volunteer mechanics. Some of these mechanics are either not qualified or require upgrades to their skills to meet today's safety standards. The one incident that resulted in an injury in 2006 involved a volunteer mechanic.

INCIDENTS IN 2006

During the year, we were informed of three incidents. Keeping in mind the relatively small number of recreational railways and the low number of days each railway operated during the calendar year, this small number of reported incidents is not entirely unexpected. Nevertheless, this number is anticipated to rise in the coming years as we clarify reporting requirements with recreational railway operators and encourage reporting.

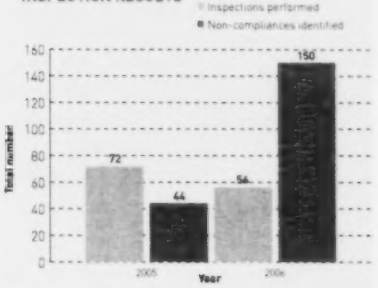
A closer examination of the three incidents shows that they were all attributed to people-related factors. One was the result of sabotage, another due to a lack of attention by a third party, while the last was traced back to a violation in procedure by a worker. Moreover, the incident involving the volunteer worker was the only incident to involve an injury—and although it was only a minor injury in this case, it could have resulted in the worker's death.

"UNDERSTANDING THE ROOT CAUSES"

In October 1999, Royal Hudson engine 2860 blew its whistle for the last time as the famed locomotive went into storage for long-awaited repairs. At the time, the owner could not afford to repair the historic locomotive and it was decommissioned and assigned for preservation. After a change of ownership and seven years spent rebuilding the boiler system, Royal Hudson 2860 made its grand debut on the tracks at the West Coast Railway Heritage Park in Squamish in 2006.

While the story of Royal Hudson 2860 turned out for the better, the problems that contributed to its demise and slow return are factors that continue to affect every recreational railway operation in BC. Lack of infrastructure investment, long response times to implement safety improvements and a shortage of qualified mechanics and workers are underlying issues that must be addressed.

2005 TO 2006 RECREATIONAL RAILWAY INSPECTION RESULTS



OUTCOME	TOTAL NUMBER OF INCIDENTS	INCIDENTS PER 100,000 PASSENGERS	TOTAL NUMBER OF INJURIES OR FATALITIES	INJURIES PER 100,000 PASSENGERS
Fatality	0	0.00	0	0.00
Permanent Injury	0	0.00	0	0.00
Major Non-Permanent Injury	0	0.00	0	0.00
Minor Non-Permanent Injury	1	0.18	1	0.18
Near Miss	2	0.35	0	0.00
Total	**3**	**0.53**	**1**	**0.18**

IMPROVING PUBLIC SAFETY

In 2006, we continued advancing our major initiative to have every recreational railway operation develop and implement a Safety Management System similar to those already seen in the railway industry. By establishing this type of system, each operator will have a clear set of roles, responsibilities and processes for dealing with safety issues. This includes confronting long-standing issues such as worker qualifications and the use of volunteers.

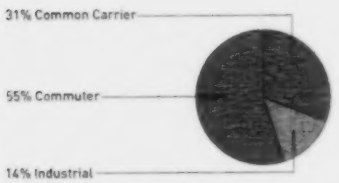
Another issue that we addressed throughout the year is the level of participation by individual recreational railway operators within the safety system. In the short term, we believe these operators can make the most significant improvements to public safety through incident data and information sharing as opposed to individually making large financial investments in safety. This being said, we have focused a great deal of our efforts at building relationships within the industry.

FUTURE OUTLOOK AND CHALLENGES

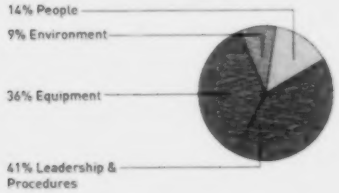
While the average recreational railway operator is highly experienced, the same cannot be said for the average mechanic. Chronic under-investment by owners and a shortage of skilled labour have forced some of these operations to rely on volunteer workers. In particular, one adverse consequence that we are starting to see is that these recreational railways are requiring greater amounts of time to upgrade their operations. This is an important safety indicator, because the longer it takes for an operation to upgrade its safety equipment and procedures, the higher the risk becomes that an unsafe hazard may be present. This is where our Safety Management System comes into play. In the coming year, we will be scrutinizing these operations against their Safety Management Systems to ensure that they not only follow their established procedures but also maintain their commitment to improving their safety system—including worker qualifications.

RAILWAYS

RAILWAY INCIDENTS BY IDENTIFIED CLASS
Total number of confirmed incidents = 160



INDUSTRIAL RAILWAY INCIDENTS BY IDENTIFIED CAUSE
Total number of confirmed incidents = 22



The BC Safety Authority oversees railway companies in BC that have a provincial Railway Certificate issued by the Ministry of Transportation. These companies operate on railway lines that are strictly within the boundaries of the province and are governed by the *BC Railway Act* and the *BC Railway Safety Act*. Companies that operate on interprovincial railway tracks (including Canadian Pacific, Canadian National Railways, Burlington Northern Sante Fe and VIA Rail) are regulated by the federal government and are therefore not the responsibility of the BC Safety Authority.

OVERVIEW - 2006

- → Regulated railway companies operating on provincial tracks
- → Provided nearly 1,800 hours of inspection time to 47 active and 13 dormant railway operations registered with the BC Safety Authority in 2006
- → Delegated accident and incident reporting requirements for Common Carrier Railways to the Canadian Transportation Safety Board in March 2006

INSPECTIONS IN 2006

In 2006, our Safety Officers completed approximately 1,500 hours of inspections among all three classes of railway operations. Considering the size and extent of these operations, a single inspection can span over multiple days and as such we report these inspections in terms of hours. Our inspection services focus on three key areas: Canadian Rail Operating Rules, Track Safety Rules and mechanical issues.

Following up on work done in previous years, we have found that all of the railways have completed their Safety Management Systems requirements. Our Safety Officers have noticed cases where safety is beginning to improve now that these operations are using their Safety Management System. This includes one operation, which under the guidance of their system, performed periodic safety testing to their track and found a number of safety risks present, particularly from overgrown vegetation. In response, this operation is now implementing actions to manage and eliminate these risks.

One issue that our Safety Officers have noticed is that industrial railways vary in their record-keeping methods. This, among other issues, will be addressed in 2007 as we continue to bring uniformity to the use of Safety Management Systems.

INCIDENTS IN 2006

Among the three classes of railways, there were 160 incidents reported to the BC Safety Authority. Included in this figure are 49 incidents that occurred on Common Carrier railways, who report their incidents directly to the Canadian Transportation Safety Board as of March 2006. The Canadian Transportation Safety Board performs accident investigation and reporting for railways operating on federally regulated tracks, and through an agreement with the BC Provincial Government, also provides the same service to Common Carrier railways in BC. Under this agreement, the Canadian Transportation Safety Board reports the number of Common Carrier accidents and incidents to our organization.

Similar to trends seen in other technologies, we have found that the railway with the highest number of incidents is the one that has the most interaction with the general public – the commuter railway. In 2006, the commuter railway system reported 89 incidents. Included in this figure are a high number of incidents that were not directly related to the performance of the railway's safety system but instead were the result of other factors such as crime, horseplay or an individual's health reasons.

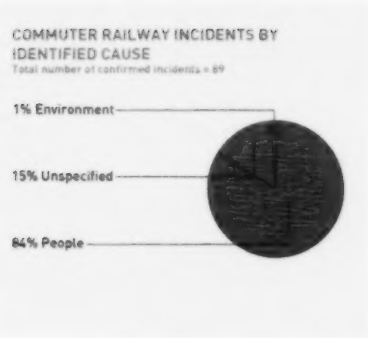
The willingness to report incidents from the commuter railway is the direct result of a strong safety-oriented culture for the operator's passengers and employees. In fact, this railway was able to reduce its own operating costs significantly by systematically investigating and analyzing incidents, and then implementing changes to improve safety.

Within the industrial railway class, 22 incidents were reported to us in 2006. Most of these incidents were procedural or mechanical in nature that resulted in damage to equipment but rarely in the injury of people.

There were 94 injuries and two fatalities reported among all classes of railways. The majority of these injuries were relatively minor, with eight considered serious. In the cases involving a fatality, subsequent investigations found that each case was the result of a suicide.

Throughout 2006, the BC Safety Authority regulated three classes of railways:

1. Common Carrier (5 active railway operations)
   → Railways whose cars interchange with other railways
2. Industrial (41 active railway operations)
   → Railways operating in an industrial setting
3. Commuter (1 active railway operation)
   → A railway whose primary function is to transport passengers in an urban environment



RAILWAY CLASS	TOTAL NUMBER OF INCIDENTS	INCIDENTS PER UNIT
Common Carrier	49	13.05 per 100,000 Freight Train Miles[1] 8.11 per 100,000 Freight Train Kilometres
Industrial	22	12.50 per 100,000 Cars Handled[2]
Commuter	89	0.13 per 100,000 Passengers Carried[3] 0.82 per 100,000 Car Kilometres[4]

[1] 375,340 Freight Train Miles [2] 176,004 Cars Handled [3] 67,657,600 Passengers Carried [4] 10,799,941 Car Kilometres

IMPROVING PUBLIC SAFETY

Throughout the year, our inspection activity uncovered that it was difficult to apply legislation, regulation and Safety Management Systems among each class of railway. In response, we are working in partnership with the industry to review the existing legislation to identify areas where it can be applied more effectively. The results of this review will ultimately help our Safety Officers identify and educate railway operators on the key safety areas that tend to be overlooked or misapplied in their operations.

In 2006, we also established an ad hoc group within our Railway Technology Committee to review the guidelines for the design, construction and operation of commuter railways in BC. This work is being done in preparation for the increasing number of commuter railway operations that are planned or under construction. By influencing safety before the equipment is constructed, we can eliminate certain hazards before they even pose a risk to the public.

FUTURE OUTLOOK AND CHALLENGES

With climate change becoming one of the major public issues of 2006, we have seen interest in zero-emissions technology increase over the past year. In particular, the expansion of commuter railway technology is one avenue that communities have explored to help reduce overall vehicle emissions. An example of this can be seen in the Canada Line extension of the Translink commuter railway system, which is currently under construction and scheduled to begin partial testing in 2008.

In the coming years, we expect the demand for commuter railway technology to increase as the population of BC continues to grow and build around major urban areas. While expansions of railway technology are already planned for suburban areas, we expect to see demand for street-level railway technology increase as major urban areas deal with the issue of moving more people within the same amount of space.

DEFINITIONS

CONSULTATION DEFINITIONS

Ad Hoc Issue Group: A small working group that makes recommendations on a particular issue to its designated Technology Committee.

Technology Committee: Non-decision-making bodies comprised of volunteer industry representatives that have a primary role of identifying and advising the BC Safety Authority on public safety issues pertinent to the Authority's mandate.

DOCUMENTS AND PUBLICATIONS

Directives: A document that clarifies interpretations of code or regulation requirements, provides direction concerning how a regulation will be applied or serves as the instrument by which a Provincial Safety Manager exercises a power granted under the *Safety Standards Act*.

Equivalent Standards Agreement: An objective-based contract made between the BC Safety Authority and a regulated company. Under this agreement, the emphasis for safety is placed on what needs to be achieved, not how it is to be achieved.

Information Bulletins: Non-statutory and non-binding instruments that provide general information to employees, stakeholders and the public.

Safety Management System: A formal framework that systematically sets out a company's rules, procedures and responsibilities with regards to safety.

Safety Orders: Binding instruments issued by Provincial Safety Managers to prevent, avoid or reduce the risk of personal injury or damage to property.

INCIDENT CAUSES

Environment: An incident primarily caused by or involving climate, weather or natural occurring conditions. Examples include incidents caused by wind, lightning, earthquakes, hail, snow and mud or rock slides.

Equipment: An incident primarily caused by or involving regulated machinery or products. Equipment-related incidents are caused by either a product failure, design flaw or manufacturing flaw.

Leadership and Procedures: An incident primarily caused by or involving a failure to manage and adhere to established safety guidelines, processes and standards. This includes causes such as inadequate staff training, lack of staff, lack of maintenance, incorrect procedure, poor quality control and misuse of equipment.

People: An incident primarily caused by or involving human-related factors. These human factors include lack of attention, a rule violation, lack of knowledge and sabotage.

Undetermined: An incident where the primary cause cannot be assessed or confirmed. Undetermined incidents are normally the result of not enough evidence remaining from a fire and as such it is not possible to either confirm or deny that regulated equipment caused the incident.

Unspecified: An incident where the cause was not identified when reported to the BC Safety Authority. These incidents are normally investigated by another organization and later reported to the BC Safety Authority.

INCIDENT DEFINITIONS

Confirmed Incident: An incident that has established causal involvement by regulated equipment.

Disqualified as an Incident: Reported cases that do not meet the minimum requirements of an incident (as defined within the BC Safety Authority).

Household Incident: An incident that has occurred in a residential setting or premises.

Incident: An event occurring that involves technology overseen by the BC Safety Authority and either:

(a) causes death, personal injury or damage to property, or

(b) creates a risk of personal injury or damage to property.

Non-Household Incident: An incident that has occurred in a non-residential setting or premises. This includes commercial, industrial, construction, institutional and recreational premises.

Reported Case: A suspected incident that has been registered with the BC Safety Authority. Following investigation, all reported cases are evaluated against the definition of an incident and are further classified as either an actual "incident" or "disqualified as an incident".

INJURY CLASSIFICATION

Permanent Injury: An injury that involves long-term impairment of function or loss of function of any body part, organ or mental faculty.

Major Non-Permanent Injury: An injury that involves significant physical pain and some disability or loss of function; includes fractures, internal injuries or wounds that are serious but not life threatening, and psychological trauma that results in some temporary or partial disability. Further professional medical attention is required.

Minor Non-Permanent Injury: An injury that may require some medical treatment; includes lacerations, contusions, abrasions or any other injuries that have no residual effect. Further professional medical attention is not required.

Near Miss: An incident where no actual harm resulted, but the contributory causes are serious and under different circumstances may have led to serious injury or death.

INSPECTION DEFINITIONS

Certificate of Inspection: A report completed by a Safety Officer to document the inspection of regulated work and/or product.

Inspection: A physical examination of work and products to see if they meet safety requirements.

Non-Compliance: A failure to comply with a required code or safety regulation.

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